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ABSTRACT

MATHCO is a motivating series of audiovisual and print materials designed to overcome the negative effects of sex bias and stereotyping on the attitudes, interests, and aspirations of girls toward mathematics and mathematics-related careers. The materials teach mathematics skills, demonstrate relationships between mathematics and other subjects, and provide exposure to mathematics-related careers. They are useful for boys as well as girls at the pre- and early-adolescent stage; they are both multiethnic and nonsexist in text and illustrations. This guide provides background information for workshop leaders and detailed instructions for conducting workshops. Appendices include a questionnaire and transparency masters for using MATHCO and for MATHCO objectives. (MNS)

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University of Oklahoma
Southwest Center for Human Relations Studies
Norman, Oklahoma

Women's Educational Equity Act Program
U.S. Department of Education

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MATHCO INSERVICE MANUAL:
A GUIDE FOR THE WORKSHOP LEADER

Carole Hall Hardeman, Ph.D., Project Director

Barbara T. Laquer, Project Specialist

Southwest Center for Human Relations Studies
University of Oklahoma

WOMEN'S EDUCATIONAL EQUITY ACT PROGRAM
U.S. DEPARTMENT OF EDUCATION

T. H. Bell, Secretary

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STATEMENT OF ENDORSEMENT

The National Review Board has carefully examined and heartily endorses MATHCO as a high-quality and motivating series of audiovisual and print materials designed to overcome the negative effects of sex bias and stereotyping on the attitudes, interests, and aspirations of girls toward mathematics and math-related careers.

These materials have been designed to teach math skills, demonstrate interrelationships between math and other subjects, and provide exposure to a wide variety of math-related careers. These informational and skill-building activities are valuable for boys as well as girls and are both multiethnic and nonsexist in text and illustrations.

We believe that the use of these materials with pre- and early-adolescent students can help to alleviate the math anxiety and avoidance that are characteristic of girls at these ages, resulting in their disproportionately small numbers in high-level mathematics courses and math-related careers.

Over the past two years, the Board has provided advice and assistance to the MATHCO staff as it has conceived, developed, and validated these materials. We are confident that our enthusiasm for this project will be shared by educators throughout the country.

Dr. Rita Bornstein
Title IX Coordinator, Florida School Desegregation Consulting Center, University of Miami

Iris Bruce
Director, Division of Guidance and Counseling, Oklahoma State Department of Education, Oklahoma City

Connie Earhart
Assistant Director, Midwest Race and Sex Desegregation Assistance Centers, Kansas State University, Manhattan

Dr. Thomas Gallaher
Director, Oklahoma Consortium Teacher Corps Project, University of Oklahoma, Norman

Dr. Geneva Gay
Associate Professor, Department of Education, Purdue University, West Lafayette, Indiana

Iola Hayden
Executive Director, Oklahomans for Indian Opportunity, Norman, Oklahoma

Robert M. Malinka
Project Director, National Middle School Resource Center, Indianapolis, Indiana

Adeline Naiman
Director, Special Projects, Education Development Center, Newton, Massachusetts

Dr. Charles Rankin
Director, Midwest Race and Sex Desegregation Assistance Centers, Kansas State University, Manhattan

Dr. Marzell Smith
Associate Director, Florida School Desegregation Consulting Center, University of Miami

Florence M. Yoshiwara
Executive Director, Japanese-American Curriculum Project, Inc., San Mateo, California

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CAPSULE HISTORY OF MATHCO

Difficulties with mathematics, or a dislike of mathematics and consequent avoidance of the study of this discipline, are common among U.S. high school and college students. However, studies have shown that young women are much more seriously affected than young men are. Furthermore, many young women are unaware of the relevance of quantitative training to their future employment--not realizing that preparation in mathematics opens up many job possibilities not available to students prepared solely in the humanities.

This math-avoidance phenomenon is widespread and its contributing causes are many and varied. It is generally agreed that societal sex-role stereotyping and socialization are prime factors responsible for many young women's fear of mathematics.

In recent years, colleges and universities across the nation have initiated seminars, workshops, remedial programs, and research development to help combat the problem of math anxiety in their students. MATHCO is unique in that it is an attempt to reach young people at the age when this math breakdown occurs--at the junior high/middle school level. Until about age 12, girls and boys do equally well in math, but subsequently, girls' interest and achievement in mathematics decline.

Basic to the MATHCO materials is a commitment to the middle school philosophy of exploration and an acute awareness of the importance of the learner's self-concept and self-image. MATHCO materials are geared to enhance the young learner's understanding of the interdisciplinary nature of math as related to careers and to life itself. These curricular offerings will help alleviate the buildup of math anxiety and offset those sex-role stereotyped career images that children have already developed by the time they have entered the middle school years of their education.

THE NEED FOR MATHCO INSERVICE TRAINING

Many curricular materials are not introduced to those persons who will be using them; they just appear in the textbook storage room. It is felt by the MATHCO staff and the National Review Board that this inservice training is a comprehensive and efficient way in which to introduce the MATHCO curriculum to middle school math teachers.

It is strongly recommended that a school system not introduce these curricular materials without first having this 8-hour Inservice Workshop. This thoroughly tested Inservice Workshop is divided into two 4-hour sessions.

It is also recommended that the Inservice Workshop conductor be a person with proven leadership skills.

PREPARATION FOR WORKSHOP LEADER

In order for you to become familiar with all elements of the MATHCO program, you will need a complete set of MATHCO materials at least two weeks before you plan to present PHASE I of the workshop. These materials consist of the following:

INSERVICE MANUAL

TEACHER'S GUIDES, MODULES 1-5, including STUDENT ACTIVITY SHEETS

CAREER WALL CHARTS, SIX

AUDIOVISUAL MATERIALS:

MODULE 1: 12-minute sound filmstrip

MODULE 2: 7 1/2-minute sound filmstrip

12-minute audiotape

MODULE 3: 15 1/2-minute sound filmstrip

MODULE 4: 13-minute sound filmstrip

MODULE 5: 19-minute sound filmstrip

You will also need to obtain a filmstrip projector and a screen for your use as you preview all filmstrips, and a cassette tape player for the audiotape to be used in Lesson 6 of Module 2. There are also student activity sheets (Modules 1-5) available under separate cover for use by students.

It is recommended that you proceed through all materials in the same way that you will assist your group of teachers in learning about MATHCO. Pages 5-6 of this manual provide an abbreviated outline of the suggested format for the training sessions you will be conducting. Pages 7-16 detail each step of the training sessions. Follow these comprehensive directions step by step as you yourself become completely familiar with the whole of MATHCO. In this manner, you will be able to predict how your workshops will run and anticipate any changes you will need to make, depending on the size of the group you will be working with and the facilities in which you will be working.

It is strongly suggested that you work through both PHASE I and PHASE II of the workshop outline before conducting PHASE I with your group. This will enable you to be totally prepared to handle any questions which may arise.

You will probably want to suggest that each group of teachers representing a particular school sit down together sometime after PHASE II of the workshop is over to map out the best strategy for MATHCO coverage in their school. It has been found that math teachers who utilize the skills of other appropriate subject matter teachers for particular activities underscore the interdisciplinary nature of the MATHCO materials.

The most important thing for you to do is to become totally acquainted with each component of the MATHCO materials. Visualize yourself in a math classroom over the course of a school year and imagine how you would use these materials. Then, when a specific question is raised by a teacher during your workshop, you will be able to give a concrete answer or suggestion. Be mindful, however, that these materials are very adaptable and that each teacher will use them in the way that feels most comfortable.

Make sure you have all necessary materials and equipment before beginning each phase of the workshop. Be sure, also, that you have good audiovisual equipment; the better the equipment, the better and more enjoyable are the audiovisual presentations.

INSERVICE WORKSHOP OUTLINE

PHASE I

A.	Introduction	15 minutes
B.	Taking of the MATHCO Inservice Questionnaire	15 minutes
C.	Objectives of MATHCO Explained	20 minutes
D.	Module 1 Audiovisual Is Viewed	15 minutes
E.	Groups Read and Discuss Background Information	45 minutes
	Short Break	10 minutes
F.	Small-Group Presentations of Background Information	45 minutes
G.	Module 1 Career-O-Scope Activity and MATHCO Career Wall Charts Explained	10 minutes
	Short Break	10 minutes
H.	Examination of MATHCO Teacher Guides	20 minutes
I.	"How to Use MATHCO" Explained	25 minutes
J.	Assignment for PHASE II of Workshop Is Given	10 minutes
	Approximate Duration:	4 hours

PHASE II

A.	Introduction	15 minutes
B.	Review of Module 1	5 minutes
C.	Coverage of Module 2	25 minutes
D.	Coverage of Module 4	45 minutes
	Break	20 minutes
E.	Coverage of Module 3	50 minutes
F.	Coverage of Module 5	45 minutes
G.	Taking of the MATHCO Inservice Questionnaire	15 minutes
H.	Comparisons, by Participants, of Their Inservice Questionnaires	20 minutes
	Approximate Duration:	4 hours

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COMPREHENSIVE INSTRUCTIONS TO MATHCO INSERVICE WORKSHOP LEADER

(PHASE I)

Materials you will need to conduct this session:

A MATHCO Inservice Questionnaire for each workshop participant (duplicate copies from the master in the back of this guide)

Module 1 audiovisual (filmstrip)

A filmstrip projector

A set of MATHCO Teacher Guides for each participant (five modules per set)

An overhead projector

A screen onto which you will project audiovisuals and transparencies

One or two sets of Career Wall Charts (arrange these ahead of time on the walls of your meeting room)

Set of seven transparencies--Objectives of MATHCO (these are in the back of this guide)

Set of two transparencies--How to Use MATHCO (these are in the back of this guide)

A. Introduction Time _____

Introduce yourself briefly and have workshop participants introduce themselves (the extent of this exercise will, of course, depend upon your particular group).

The workshop leader will set the stage for a productive session by carefully directing the participants' attention to the following:

1. The goals of this inservice workshop:
   - to demonstrate to teachers the need for the MATHCO program
   - to familiarize teachers with all MATHCO materials
   - to show teachers how MATHCO will be used by them in their classrooms
2. A preview of those activities which will be done in PHASE I of this workshop.
3. Your expectations for this workshop session in light of the recommended time-line parameters.
4. The expectations of your participants. Encourage a short discussion to make sure you are all on the same wave length.

B. Taking of the MATHCO Inservice Questionnaire Time _____

Explain to participants that the purpose of this exercise is to allow teachers to explore their own attitudes and feelings about a variety of issues concerning math avoidance. It has been found that having to face these issues head-on inspires teachers to come to MATHCO convinced that there is, indeed, a need for these materials.

After all participants have completed their questionnaires, you should collect and store the questionnaires until PHASE II of this workshop. These questionnaires should not be read, scored, or rated by you in any way. They will be used by the participants in PHASE II to compare their responses to the same questionnaire taken a second time (after exposure to the MATHCO materials).

C. Objectives of MATHCO Explained Time _____

Using the set of seven transparencies, the workshop leader will explain the objectives of the MATHCO program. Each of these objectives is also found on page 9 of the MATHCO Teacher's Guide, Module 1. Project these transparencies with the overhead projector and discuss them with your group. Then paraphrase them according to the additional narrative found on page 9 of the MATHCO Teacher's Guide, Module 1.

D. Module 1 Audiovisual Is Viewed Time _____

Preface the viewing of this Math and Careers audiovisual by telling participants that MATHCO consists of a series of motivational audiovisual presentations which set the stage for activities to be done by students in the classroom. This particular audiovisual was selected to be viewed first because it best expresses the overall philosophy of MATHCO and it will give teachers some insights into what MATHCO is all about.

As this presentation is only 12 minutes long, you will have time to entertain a few brief comments from the participants. Be certain to let participants know that they will later come to understand where this audiovisual fits into the totality of MATHCO. Assure them that there will be time provided later for them to process (discuss) this audiovisual.

E. Groups Read and Discuss Background Information Time _____

Pass out a copy of the MATHCO Teacher's Guide, Module 1, to each participant.

Break your large group down into three smaller groups. Each group will work with one of the following topics:

Group 1: Educational Practices That Discourage Young Women (and Young Men) from Pursuing Mathematics Studies (Module 1, pages 15 to 27)

Group 2: Math Anxiety/Math Avoidance (Module 1, pages 28-34)

Group 3: Sex-Related Differences in Mathematics Achievement and Performance: Myth or Reality? (Module 1, pages 35-40)

Note: If you are working with a very large group, you may want to have two groups work with each topic. If you have an uneven number of participants, it is suggested that Group 1 contain the smallest number of participants.

The groups' assignment is to read their topics, making notes of important and/or interesting information and data as they go along (for 20 minutes); to discuss their topics among themselves (for 15 minutes); and to prepare for a group presentation back to the larger group (for 10 minutes). Their reports should reflect what they consider to be the main points or highlights of their topics. They should be aware that they will have approximately 5 minutes to present their reports.

Short Break (10 minutes) Time _____

F. Small-Group Presentations of Background Information Time _____

Allow approximately 5 minutes each for the reports of each small-group topic. This will allow you 30 minutes (either interspersed or at the end) to bring to participants' attention any points which were not mentioned and which you believe are important and/or relevant to your group of participants.

The purpose of Activities E and F is to familiarize participants with the issues that the MATHCO program was developed to address.

G. Module 1 Career-O-Scope Activity and MATHCO Career Wall Charts Explained Time _____

Direct participants' attention to page 47 of the MATHCO Teacher's Guide, Module 1. Explain to participants that after their students have viewed the Module 1 audiovisual (viewed by participants previously), they will complete the MATHCO Wizard's Career-O-Scope activity. Briefly review the three components of this activity and explain how it should be administered.

The participants' attention should now be directed to the MATHCO Career Wall Charts (which you should have displayed on the walls of your meeting room). Have them turn to pages 70 and 71 of the MATHCO Teacher's Guide, Module 1, which indicate several display configurations that they may choose to use in their classrooms.

Short Break (10 minutes) Time _____

Before dismissing participants for their break, explain that you will be passing out the MATHCO Teacher's Guide, Modules 2, 3, 4, and 5. They should browse through them to become familiar with their contents.

H. Examination of MATHCO Teacher's Guides Time _____

After participants have returned from their break, allow them an additional 20 minutes to become somewhat familiar with the MATHCO print materials. They should be directed to note specifically the following:

Organization of modules	Career information
Content of modules	Optional activities
Information provided on Teacher Activity Sheets	Information provided on Student Activity Sheets
Length of activities	Interdisciplinary nature of materials

I. "How to Use MATHCO" Explained Time _____

Using the information on How to Use MATHCO found on page 10 of the MATHCO Teacher's Guide, Module 1, and the two transparencies showing a Sample Time Line, spell out to participants just how MATHCO will be used by them in their classrooms.

Because particular schools and/or school systems will be using MATHCO in varying ways, depending upon how the school or system is organized, use this time either to (a) discuss how your school and/or system recommends that MATHCO be used (if this has already been decided); or (b) tell participants that each group of teachers representing a particular school will need to sit down together sometime after PHASE II of the workshop to map out the best strategy for MATHCO coverage in their school.

Ideally, MATHCO will be incorporated over an entire school year by 6th, 7th, and/or 8th grade teachers. This may not be possible if your teachers have different students during the second half of the school year. In that case, some consistent (and not overlapping) system of application and coordination needs to be worked out. It is probably best to wait until after PHASE II of the workshop to work out these details.

J. Assignment for PHASE II of Workshop Is Given Time _____

Request participants to prepare the following assignment:

1. Review and become totally familiar with all the background information which was covered in Activities E and F of PHASE I of this workshop.

2. Become very familiar with the MATHCO print materials contained in the MATHCO Teacher's Guide, Modules 1-5.

The review of background information will give participants a more comprehensive understanding of all the issues involved which led to the development of the MATHCO program. It cannot be emphasized too

strongly that the teacher is the key to the success of MATHCO and must build a commitment to the issues that MATHCO is addressing.

By providing at least 3 days before PHASE II of the workshop, participants will have time to review all of MATHCO's print materials. This will give them a good perspective on what MATHCO is all about and provide them with the information they need to get the most out of PHASE II of the workshop.

COMPREHENSIVE INSTRUCTIONS TO MATHCO INSERVICE WORKSHOP LEADER

(PHASE II)

Materials you will need to conduct this session:

Workshop participants must bring their MATHCO Teacher's Guides, Modules 1-5, with them

A filmstrip projector

A cassette tape player

Filmstrips for Modules 2-5 and the audiotape for Module 2; have filmstrips and projector ready ahead of time

A screen onto which filmstrips will be projected

Student MATHCO Magic Squares form for each participant (duplicate copies from the master in the back of this guide)

A MATHCO Inservice Questionnaire for each participant (duplicate copies from the master in the back of this guide)

The MATHCO Inservice Questionnaires which you collected during PHASE I of this workshop

Optional: You may wish to arrange some Career Wall Charts on the walls of your meeting room just for reinforcement purposes (even though this element of MATHCO has been covered).

A. Introduction Time _____

Set the stage for a productive workshop session by carefully directing participants' attention to the following:

1. Review of PHASE I of the workshop:
   - what was covered
   - how PHASE I leads into PHASE II of the workshop
2. The goals of this inservice workshop:
   - to demonstrate to teachers the need for the MATHCO program
   - to familiarize teachers with all MATHCO materials
   - to show teachers how MATHCO will be used by them in their classrooms
3. A preview of those activities which will be done in PHASE II of this workshop.
4. Direct participants to pages 6-8 of their MATHCO Teacher's Guide, Module 1, and review the itemized listing of all components of the MATHCO program.

Briefly explain that MATHCO consists of a series of motivational filmstrips and accompanying activities which are arranged in five modules. Emphasize that whereas they now have an awareness of what is contained in the MATHCO print materials, after this session they will have a better understanding of how all of MATHCO's elements fit together.

Provide time for a brief question-and-answer period if participants have any general questions. However, suggest that there will be time allotted later in the session for more specific questions to be answered.

B. Review of Module 1 Time _____

Remind participants that this module was covered in depth during PHASE I of this workshop. Explain to them that this filmstrip should be viewed by their students soon after their initial exposure to MATHCO. Teachers should encourage some discussion after their students have viewed this presentation.

Briefly remind participants of the order of presentation of Module 1: (a) discussion of filmstrip, (b) Career-O-Scope activity, (c) Career Wall Charts.

As you briefly cover this segment, direct participants' attention to pages 47 to 71 of the MATHCO Teacher's Guide, Module 1.

C. Coverage of Module 2 Time _____

Show Module 2 filmstrip, "Patterns, Sequences, and Equations," and review explanatory material found on pages 1 to 2 of the MATHCO Teacher's Guide, Module 2. Explain that after students have seen and discussed this audiovisual, the teacher will select as many Module 2 activities as he or she deems appropriate to cover with the students over a 5- to 7-week period. Encourage participant discussion of this module's filmstrip and activities.

D. Coverage of Module 4 Time _____

Show Module 4 filmstrip, "Close Encounters with Everyday Math." Explain to participants that this module is being covered "out of order" to reemphasize the fact that Modules 2 through 5 may be taught in whatever order the teacher prefers--there is no correct order.

Direct participants' attention to the MATHCO Teacher's Guide, Module 4, and review the explanatory material found on pages 1 to 2. Explain that after students have seen and discussed the Module 4 audiovisual, the teacher will select as many Module 4 activities as she or he deems appropriate to cover with the students over a 5- to 7-week period. Briefly outline to participants the types of activities offered in this module and entertain any questions that may arise.

Break (20 minutes) Time _____

E. Coverage of Module 3 Time _____

Show Module 3 filmstrip, "Math in Your World." In the same manner as used previously, review Module 3 explanatory material found in the MATHCO Teacher's Guide, Module 3, on pages 1 to 2. Explain that after students have seen and discussed this filmstrip, the teacher will select the activities she or he wishes to cover with students over a 5- to 7-week period. Briefly go over the outline of module activities and entertain any questions which participants may have.

This is a good time to reemphasize the importance of the interdisciplinary nature of MATHCO materials. Although they may approve philosophically of this approach to learning, many math teachers are sometimes reluctant to give up time in their classrooms for an activity that does not solely employ math concepts. Point out that this often leads students to compartmentalize mathematics and not to make connections between math and the other subjects that they are learning.

F. Coverage of Module 5 Time _____

Show Module 5 filmstrip, "MATHCO's Magic Squares." Cover the explanatory material found on pages 1-2 of the MATHCO Teacher's Guide, Module 5. Stress the fact that Module 5 activities are based on experience, but are easily covered by teachers with little or no science background. The additional materials required to conduct some of these experiments are easily obtainable. However, many math teachers using this module in the past have chosen to work closely with one or more of the science teachers in their school.

Briefly review the outline of module activities and entertain any questions that participants may have.

G. Taking of the MATHCO Inservice Questionnaire Time _____

Pass out an Inservice Questionnaire to each participant. Explain that this is the same questionnaire they took during PHASE I of the workshop.

H. Comparisons, by Participants, of Their Inservice Questionnaires Time _____

After all participants have completed their Inservice Questionnaires, return to them the questionnaires that they took during PHASE I of the workshop.

Allow several minutes for participants to compare their own questionnaires. In many cases, they will have completely changed their minds regarding many of the items on the questionnaire.

Encourage discussion regarding specific items on the questionnaire. Explain to participants that the sole purpose of this exercise was to help them face, head-on, those issues which showed the need for the development of MATHCO. For your information, many of the statements on this questionnaire have been made somewhat ambiguous--just to provoke what may be a very stimulating and helpful discussion.

Entertain any further questions which participants may have regarding the MATHCO program.

APPENDIX A

MATHCO INSERVICE QUESTIONNAIRE

Your Name _____ Today's Date _____

MATHCO INSERVICE QUESTIONNAIRE

Please respond to each of the following items by circling the answer category which best represents your opinion:

SA =	Strongly Agree
MA =	Moderately Agree
N =	Neutral
MD =	Moderately Disagree
SD =	Strongly Disagree

1. Few adults exhibit symptoms of math anxiety. SA MA N MD SD

2. Girls in high school do better in English than in math; boys do better in math. SA MA N MD SD

3. The teacher who takes no joy in mathematics, to whom mathematics is only a set of units to be "covered" by a certain date, is unlikely to be effective in the ways that matter the most. SA MA N MD SD

4. In 1975, the national median income for women was approximately $7,500, while the median income for men was approximately $12,800. SA MA N MD SD

5. The school is an effective instrument of social control SA MA N MD SD

6. More boys perceive mathematics as likely to be helpful in earning a living than do girls. SA MA N MD SD

7. Most schools offer "equal opportunity" in career preparation to both males and females. SA MA N MD SD

8. All girls should be "ladylike"; all boys should be "aggressive."	SA	MA	N	MD	SD
9. Math anxiety/avoidance affects only a very small percentage of men, women, girls, and boys.	SA	MA	N	MD	SD
10. Parents who dislike math can influence their children, who, in turn, will also dislike math.	SA	MA	N	MD	SD
11. Examples of female mathematicians are given in most 7th through 12 grade math textbooks.	SA	MA	N	MD	SD
12. Mathematics, as a skill, is a critical filter into the American job market.	SA	MA	N	MD	SD
13. In most secondary schools, counselors do not encourage girls to elect upper-division math and science courses.	SA	MA	N	MD	SD
14. Emphasis on "getting the correct answer" is the most effective method of developing children's math skills.	SA	MA	N	MD	SD
15. Math textbooks tend to portray both males and females involved in a variety of occupations and activities.	SA	MA	N	MD	SD
16. Parents and teachers tend to emphasize math more for boys than for girls and are more unhappy with boys when they decide to stop taking math courses.	SA	MA	N	MD	SD
17. "Success" is viewed by most females and males in our country as masculine-oriented and/or unfeminine.	SA	MA	N	MD	SD

18. Math teachers treat high achievers and low achievers with equal respect in their classrooms. SA MA N MD SD

19. Math anxiety can begin at a very early age. SA MA N MD SD

20. Cooking and sewing classes are better classes for girls to enroll in than for boys to enroll in. SA MA N MD SD

21. Boys "naturally" like math more than do girls. SA MA N MD SD

22. Math textbooks offer positive role models for all students. SA MA N MD SD

23. The continuous study of math through the 12th grade assures students a wider range of career options when they leave high school. SA MA N MD SD

24. Reading labs have been established in most school systems to help students who exhibit poor reading skills. SA MA N MD SD

25. Math labs have been established in most school systems to help students who exhibit poor math skills. SA MA N MD SD

26. Reading labs are needed much more than are math labs. SA MA N MD SD

27. Math avoidance is likely to occur when a student fails to understand a certain math concept, yet keeps moving along into higher concepts until she or he reaches her or his limit. At this point, math becomes an extremely frustrating experience. SA MA N MD SD

28. Women in college tend to major in the humanities and other nonquantitative subjects, which usually lead to low-paying jobs. SA MA N MD SD

29. Educators in general treat boys and girls equally. SA MA N MD SD

30. Most students are likely to overcome their math anxiety while they are still in school. SA MA N MD SD

31. When math teachers continually examine "the process" students use while solving math problems, concepts can be strengthened and retaught, if necessary. SA MA N MD SD

32. The more math courses a student elects to take in high school, the better his or her SAT scores are likely to be. SA MA N MD SD

33. In general, men and women receive equal pay for equal work in the U.S. SA MA N MD SD

34. Teachers' attitudes about math greatly influence students' attitudes about math. SA MA N MD SD

35. In 1975, the U.S. college-educated male's median income was almost $18,000, while the college-educated female's median income was only about $11,000. SA MA N MD SD

36. In most math textbooks, males and females are shown participating together in career-oriented activities. SA MA N MD SD

37. Math teachers provide equal opportunities for boys and girls to respond to questions in the classroom. SA MA N MD SD

38. More girls than boys tend to avoid the study of mathematics. SA MA N MD SD

39. Boys have more natural ability to do math problems than girls have. SA MA N MD SD

40. Math teachers encourage girls to select careers which are math-oriented (engineers, scientists, physicians, etc.) at the same level at which they encourage boys to select these careers. SA MA N MD SD

41. Math anxiety is an irrational and hampering dread of mathematics which can affect persons who quite likely are considered to be "good students" in school. SA MA N MD SD

42. The school is an effective instrument of societal change. SA MA N MD SD

43. Children display inhibitions about learning subjects they feel are inappropriate for their sex. SA MA N MD SD

44. Woodworking, math, science, and sports are activities and subjects best suited for boys. SA MA N MD SD

45. Girls tend to take more non-required math courses in high school than do boys. SA MA N MD SD

46. Most math teachers regularly emphasize to their students those careers and/or occupations which utilize math skills. SA MA N MD SD

47. Many elementary and secondary school teachers are probably indifferent to mathematics or even dislike it. SA MA N MD SD

48. Society in general has long expected females to take little interest in mathematics. SA MA N MD SD

49. If the amount of time spent studying math is somehow equated for females and males, educationally significant sex-related differences in mathematics will disappear. SA MA N MD SD

50. The overall popularity of mathematics goes down during the high school years for both sexes. SA MA N MD SD

APPENDIX B

HOW TO USE MATHCO SAMPLE TIME LINE

(Transparency Master)

HOW TO USE MATHCO

SAMPLE TIME LINE

BEGINNING OF SCHOOL YEAR

- Module 1 Audiovisual shown to students

September

- Module 1 Activity (MATHCO Wizard's Career-O-Scope) done with students
- MATHCO Wall Charts presented

- Module 4 Audiovisual shown to students

October

- Module 4 Activities selected and covered with students over a 5- to 7-week period:*

November

Module 4, Number 7 - Checking the Check
Module 4, Number 2 - Adjusting Recipes
Module 4, Number 5 - Ordering from a Catalog
Module 4, Number 14 - Calling Long-distance
Module 4, Number 15 - Auto Math
Module 4, Number 6 - Markups

- Module 2 Audiovisual shown to students
- Module 2 Activities selected and covered with students over a 5- to 7-week period:

December

Module 2, Number 1 - Equations and Substitutions
Module 2, Number 2 - Art/Color Theory Equations
Module 2, Number 4 - Patterns and Sequences
Module 2, Number 8 - Language Arts/Composition
Module 2, Number 7 - Language Arts/Poetry
Module 2, Number 5 - Art and Music

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*Activities within a module need not be taught in any particular sequence (except when specifically stated within the module).

(Transparency Master)

HOW TO USE MATHCO

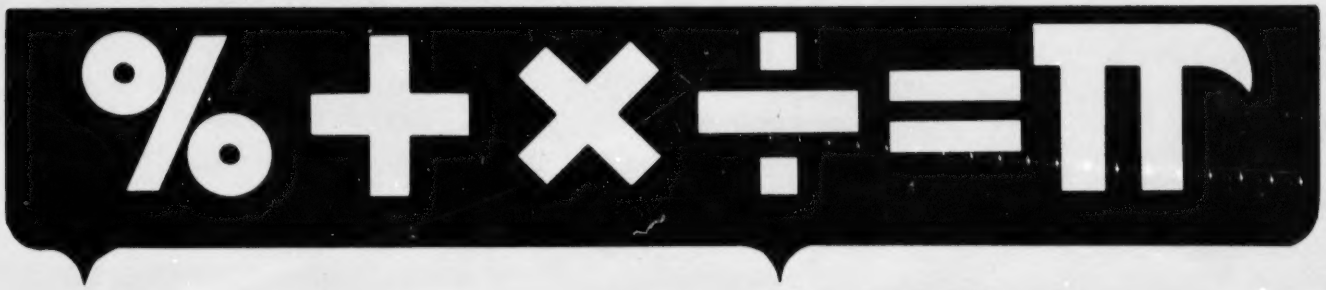
SAMPLE TIME LINE

(continued)

January	Module 2, Number 10 - Fractions/Language Arts
	Module 2, Number 13 - Graphs, Charts, Fractions/ Drama
	Module 3 Audiovisual shown to students
	Module 3 Activities selected and covered with students over a 5- to 7-week period:
February	Module 3, Number 14 - Population Growth
	Module 3, Number 6 - Allotted Classroom Area
	Module 3, Number 3 - Planning a Trip
	Module 3, Number 7 - Scale Drawing: Dream House
	Module 3, Number 11 - Commercials on Television
March	Module 5 Audiovisual shown to students
	Module 5 Activities selected and covered with students over a 5- to 7-week period:
	Module 5, Number 2 - Bicycle Gears
April	Module 5, Number 7 - Silly Pulley
	Module 5, Number 13 - Litter Study
	Module 5, Number 5 - Lung Capacity
	Module 5, Number 9 - Hygrometer
May	Module 5, Number 14 - BONUS ACTIVITY - What Do You Get When You Cross...?
June	END OF SCHOOL YEAR

APPENDIX C

MATHCO OBJECTIVES

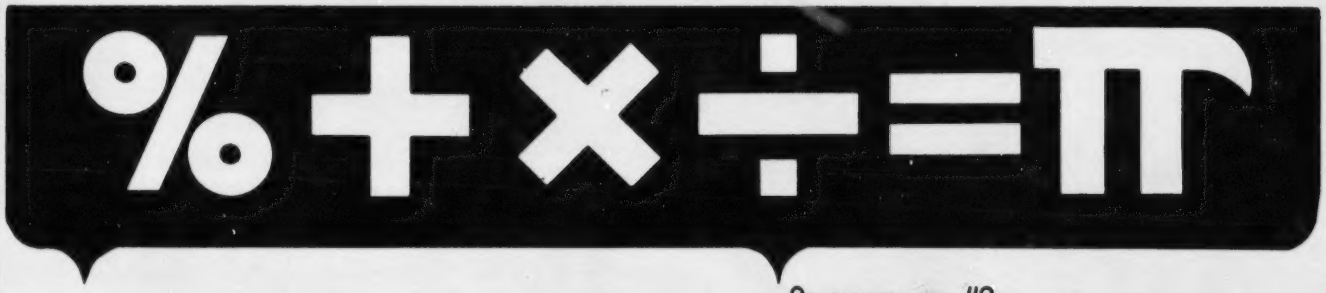


MATHCO

OBJECTIVE #1

TO PROVIDE UP-TO-DATE, VALIDATED INFORMATION ON THE UNIVERSAL AND INTERDISCIPLINARY NATURE OF MATH AND ITS RELATIONSHIP TO CAREERS

(Transparency Master)

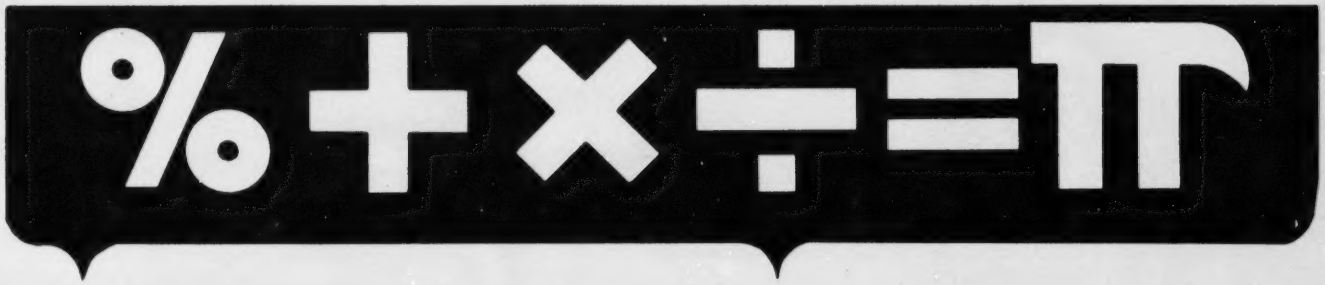


MATHCO

OBJECTIVE #2

TO REFUTE HISTORICAL ATTITUDES AND MYTHS
THAT MATHEMATICS IS NOT A DISCIPLINE TO
BE EXCELLED IN BY WOMEN AND GIRLS

(Transparency Master)

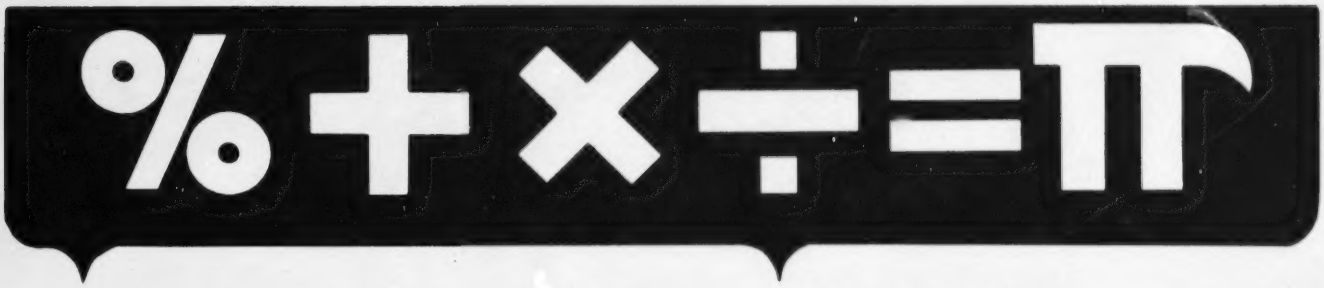


MATHCO

OBJECTIVE #3

TO PROMOTE THE ACCEPTANCE OF COMPETENT PERSONS, REGARDLESS OF SEX, IN LIGHT OF OUR CHANGING SOCIETY AND THE CHANGING RELATIONSHIPS OF MEN AND WOMEN

(Transparency Master)



MATHCO

OBJECTIVE #4

TO PROVIDE ADAPTABLE MATERIALS WHICH ARE APPROPRIATE FOR USE BOTH BY MATH TEACHERS AND BY TEACHERS OF OTHER DISCIPLINES

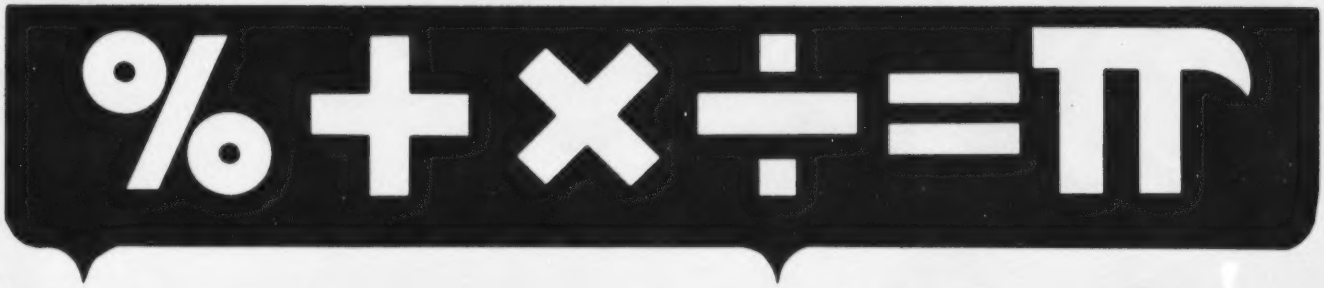
(Transparency Master)

MATHCO

OBJECTIVE #5

TO INCREASE TEACHERS' AWARENESS OF THE TREMENDOUS INFLUENCE WHICH THEY HAVE ON YOUNG WOMEN'S DEVELOPING ATTITUDES ABOUT MATHEMATICS

(Transparency Master)

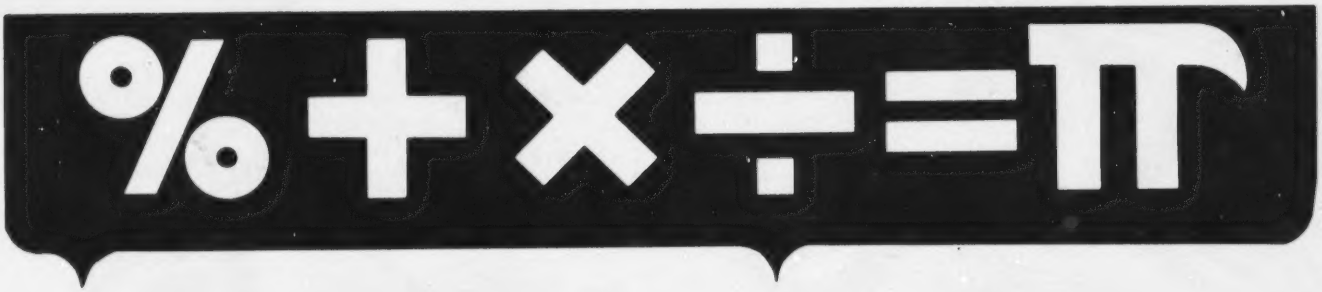


MATHCO

OBJECTIVE #6

TO PROVIDE CURRENT RESEARCH-BASED INFORMATION ABOUT CAREERS WHICH WOMEN HAVE TRADITIONALLY NOT BEEN ENCOURAGED TO ENTER AND/OR HAVE BEEN RELUCTANT TO ENTER

(Transparency Master)



MATHCO

OBJECTIVE #7

TO ENCOURAGE YOUNG WOMEN TO PURSUE
THE STUDY OF NON-REQUIRED MATH COURSES
IN HIGH SCHOOL

(Transparency Master)

APPENDIX D

MATHCO'S MAGIC SQUARES

MATHCO'S MAGIC SQUARES

Picture Sequences	Magic Squares	MATHCO Activities
1. One Day at the Zoo	☐	A. Air Pollution
2. The Great Bicycle Race	☐	B. Archaeological Dig
3. The Great Garbonzos	☐	C. Balloon Rockets
4. Sporty's Solution to Noise Pollution	☐	D. Bicycle Gears
5. One Day in the Park	☐	E. Classification of the Animal Kingdom
6. One Night at the Dig	☐	F. Hygrometer (for Measuring Humidity)
7. Ding Dong Bell - Kitty's in the Well	☐	G. Levers
8. Tower of Power	☐	H. Litter Study
9. One Day at the Styling Salon	☐	I. Lung Capacity
10. One Day at the Ball Park	☐	J. Noise Levels
11. Tarzana of the Jungle	☐	K. Pendulum Study
12. The Migration of Admirable Burd	☐ ☐	L. Proper Measurement
		M. Silly Pulley

ATTENTION ALL STUDENTS:

Part 2 of the filmstrip is just for fun. When Part 2 begins, put down your pencils and enjoy!

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